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| 09/848,830 | 05/03/2001 | Steven M. Zuniga | 002834USACY5/22558-303002 | 9467 |

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EXAMINER

CULBERT, ROBERTS P

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| ART UNIT | PAPER NUMBER |
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1792

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11/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 09/848,830 | Applicant(s) ZUNIGA ET AL. | |
| | Examiner Roberts Culbert | Art Unit 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 10/4/07 have been fully considered but they are not persuasive.

Applicant argues that Shendon fails to teach that "*the top surface is configured such that the retaining ring is removable as a unit from the base*" as recited in Claims 1 and 13. The argument is not persuasive because the retaining ring of Shendon et al. is clearly removable "as a unit" from the base, as broadly recited, simply by removing the upper portion and lower portion at approximately the same time or by using any number of cutting or disassembly means including destructive and/or non-destructive means.

Applicant argues that Shendon fails to teach a retaining ring in which a top surface of the upper portion of the retaining ring is fixed to and abutting the base as recited in Claims 1, 13, 25 and 35. The examiner respectfully disagrees. The retaining ring is "fixed to and abutting the base" as illustrated in Figures 3 and 4 of Shendon. Applicant focuses on Figure 4, however, the small gaps shown in this close-up are tolerances shown between generally abutting movable parts, further, the base and ring abut bladder 170 and spring 172 which reads on the broadly recited claims.

Applicant argues that Shendon fail to teach that "the lower portion lacks any aperture from the top surface to the bottom surface of the lower portion" as recited in Claims 31 and 35. However, the argument is not persuasive. Shendon teach screws filling the apertures relied upon by applicant, which clearly reads on the broadly recited claims. Further, it is noted that applicant's specification does not indicate that the lack of an aperture is a critical feature of the invention, but instead teaches (Page 9, Lines 25-26) that "*Alternately, instead of being adhesively attached, the lower portion can be attached with screws or press-fit to the upper portion.*" Shendon similarly teaches that screw attachment is not critical, but that "*The perimeter ring can also be mounted without screws, such as by use of key slots...*" Thus, Shendon clearly does indicate an additional embodiment where the lower portion lacks any aperture from the top surface to the bottom surface of the lower portion.

Applicant argues that one of ordinary skill in the art would consider only the retaining ring 162, not the retaining ring assembly 146 to constitute a retaining ring. However, the argument is unsupported.

Applicant has argued that the claimed range of 100-400 mils operates differently but the support given is that when the lower portion being made relatively thin to the upper portion, the rigidity of the upper portion dominates. However, similar relative proportions are illustrated by Shendon.

Applicant has argued that one of ordinary skill in the art would have been directed away from using epoxy attachment due to danger of failure. However, the argument is unsupported. One of ordinary skill in the art, aware of the light pressures used in polishing and high bonding strength of epoxies, would recognize the strong bond formed by epoxy bonding is suitable for the relatively small shear forces of polishing without failure.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1-34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "the retaining ring is removable without disassembly of the carrier head", however, since the retaining ring is expressly recited to be part of the carrier head, thus it is unclear how it may be removed without disassembly of the carrier head.

Claims 13 recites "the top surface is configured such that the retaining ring is removable as a unit from the base." It is unclear if the limitation refers to the top surface of the upper portion or lower portion since both are previously recited in the claim.

Claims 13 and 25 recite "wherein...the top surface is configured such that the retaining ring is removable as a unit from the base." It is unclear if any physical limitations are indicated by the broad and undefined claim language, since any retaining ring having an upper portion and a lower portion, however

configured or secured to the base, would appear to be "removable as a unit", simply by approximately removing the upper portion and lower portion at the same time.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5, 8, 9 12-15, 17, 20, 21, 24, 31, 32, 34-37, 39, 42, 43, 46, 47 and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0747167 A2 to Shendon et al.

Regarding Claims 1, 13 and 35, Shendon et al. teaches a carrier head for a chemical mechanical polishing apparatus, comprising: a rigid base; a substrate mounting surface that is vertically movable relative to the base; and a retaining ring to maintain a substrate beneath the mounting surface during polishing, the retaining ring including a substantially annular lower portion (162) having a bottom surface for contacting a polishing pad during polishing, wherein the lower portion is made of an engineering plastic (Delrin), and a substantially annular upper portion (148) having a bottom surface joined to the lower portion and a top surface fixed to and abutting the base, wherein the upper lower portion is made of a metal which is more rigid than the plastic. (Col. 10, Lines 20-46)

Regarding Claims 2, 3, 14, 15, 25, 36 and 37, the plastic (Delrin) is substantially inert to a chemical mechanical polishing process and has a durometer measurement between about 80 and 95 on the shore D scale.

Regarding Claims 5, 17 and 39, the upper portion is thicker than the lower portion. See figure 4.

Regarding Claims 8, 9, 20, 21, 42 and 43, Shendon teach the metal material may be aluminum which has an elastic modulus about ten to one hundred times the elastic modulus of Delrin plastic.

Regarding Claims 12, 24 and 46, Shendon et al. teach the lower portion may be press fit. (Col. 11, Lines 17-21)

Regarding Claim 31 and 35, the lower portion lacks any aperture as broadly recited.

Regarding Claim 32 and 47, the bottom surface of the lower portion is substantially planar.

Regarding Claims 34 and 49, the limitations are met by the ring of Shendon as broadly recited.

Note that the term "substantially vertical" is virtually meaningless without a supporting definition since almost any sidewall structure would meet the broadly recited limitation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 6, 7, 10, 11, 16, 18, 19, 22, 23, 25-30, 38, 40, 41, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0747167 A2 to Shendon et al.

Regarding Claims 4, 16, 25, 26, 29, 30 and 38, as applied above, Shendon et al. teaches the method of the invention substantially as claimed, but does not expressly teach that the lower portion is between about 100 and 400 mils thick.

However, the dimensions of the lower portion would have been selected within the recited range by one of ordinary skill in the art as a matter of providing suitable thickness for a substrate to be polished without deforming the flexible ring during a polishing process. Further, it has been held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *See In Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Regarding Claims 6, 7, 18, 19, 27, 28, 40 and 41, Shendon et al. does not expressly teach the plastic is selected from the group consisting of polyphenylene sulfide, polyethylene terephthalate, polyetheretherketone, and polybutylene terephthalate.

However, Shendon teaches using "Delrin or similar plastic material". However, Delrin is a well known engineering plastic having high chemical, friction and wear resistance. (See applicant's specification page 12) Thus it would have been obvious to select from the well-known engineering plastics such as polyphenylene sulfide, polyethylene terephthalate, polyetheretherketone, and polybutylene terephthalate since the engineering materials have similar chemical resistance, friction and wear properties suitable for polishing

Regarding Claims 10, 11, 22, 23, 44 and 45, Shendon et al. does not expressly teach the lower portion is adhesively attached to the upper portion with an epoxy. However, Official Notice is taken by the examiner that epoxy adhesive is a well-known expedient in the art of bonding plastic to metals. Since, Shendon et al. teach that the perimeter ring may be mounted by alternative means without screws, (Col. 11, Lines 15-20) it would have been obvious to one of ordinary skill in the art at the time of invention to use an epoxy to bond the plastic and metal portions in order to provide suitable attachment of a the metal and plastic materials as an alternative to screw attachment.

Claims 33 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 747 167 A2 to Shendon et al. in view of 5,944,593 to Chiu et al.

Regarding Claims 33 and 48, Shendon et al. teach the method of the invention substantially as claimed, but fail to teach transporting slurry through channels in the bottom surface of the lower portion. Chiu et al. teach transporting slurry through channels in the bottom surface of the lower portion of a retaining ring. It would have been obvious to one of ordinary skill in the art at the time of invention to use channels in the bottom surface of the lower portion of Shendon et al. in order to provide uniform slurry distribution as taught by Chiu et al.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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R. Culbert
Examiner
Art Unit 1792

A handwritten signature in black ink, appearing to be 'R. Culbert', written in a cursive style.